

IN THE CLAIMS:

1. (Previously Presented) An undulated-wall honeycomb structure having a plurality of cell passages defining a cell passage direction, which are mutually parallel in the cell passage direction;

wherein

(1) intersection portions between walls defining said cell passages have a predetermined pitch in cross-sections perpendicular to said cell passages and are located in a pattern,

(2) wall face portions of said walls excluding said intersection portions have an undulated shape in both the cell passage direction and a cross-sectional direction perpendicular to said cell passage direction, and

(3) for each cell passage, the wall face portions of an opposing pair of said walls each have an undulated shape, such that recessions and protrusions on one wall face portion and recessions and protrusions on the other wall face portion are positioned with the protrusions of each facing one another and the recessions of each facing one another.

2. and 3. (Canceled)

4. (Previously Presented) An undulated-wall honeycomb structure according to Claim 1, wherein for each cell passage, at least one of said plurality of walls forming said cell passage has an undulated shape.

5. (Previously Presented) An undulated-wall honeycomb structure according to Claim 1, wherein said undulated-wall honeycomb structure has a center portion surrounded by an outer portion when viewed in cross-section defined substantially perpendicular to said cell passage direction, and each wall face portion of a cell passage having an undulated shape comprises a wall face portion having an undulated deformation that is greater at said outer portion of the honeycomb structure than at said center portion of the honeycomb structure.

6. (Previously Presented) An undulated-wall honeycomb structure according to Claim 1, wherein the amplitude of the undulated walls having an undulated shape is at least 150% of the thickness of said walls.

7. (Previously Presented) An undulated-wall honeycomb structure according to Claim 1, wherein a line connecting the highest portions of the protrusions and/or the lowest portions of the recessions of the wall face portions having an undulated shape in said cell passage direction repeats a pattern of turning in the direction substantially perpendicular to said cell passage direction on said wall face portions.

8. (Previously Presented) An undulated-wall honeycomb structure according to Claim 36, wherein cell passages formed by said wall face portions of said walls having an undulated shape and cell passages defined by said wall face portions of said walls having a flat shape coexist in a discontinuous manner.

9. (Previously Presented) An undulated-wall honeycomb structure according to Claim 36, wherein:

said undulated-wall honeycomb structure has a center portion surrounded by an outer portion when viewed in cross-section defined substantially perpendicular to said cell passage direction,

said center portion comprises cell passages defined by said wall face portions of said walls having an undulated shape,

said outer portion comprises cell passages defined by said wall face portions of said walls having a flat shape,

the thickness of the walls of the cell passages within said outer portion is greater than the thickness of the walls of the cell passages within said center portion, and

the thickness of the walls increases in stages from the center portion toward the outer portion or only increases in stages near a boundary between the center portion and the outer portion.

10. (Previously Presented) An undulated-wall honeycomb structure according to Claim 1, wherein the honeycomb structure is made from a material selected from the group consisting of cordierite, alumina, mullite, lithium aluminum silicate, aluminum titanate, titania, zirconia, silicone nitride, aluminum nitride, and silicon carbide; or selected from the group consisting of stainless steel, and aluminum alloy; or selected from the group consisting of an adsorbent activated charcoal, silica gel, and zeolite.

11. (Previously Presented) An undulated-wall honeycomb structure according to Claim 10, wherein the porosity of the material is between 45% to 80%.

12. (Withdrawn) A fine particle removing filter using the undulated-wall honeycomb structure according to Claim 11, comprising filtering layers of walls partitioning the cell passages, wherein one end of particular cell passages of said undulated-wall honeycomb structure and the other end of the remaining cell passages are plugged.

13. (Withdrawn) A fine particle removing filter according to Claim 12 wherein the surface roughness of the undulated walls of said undulated-wall honeycomb structure is 10% or more in Valley Level.

14. (Withdrawn) A fine particle removing filter according to Claim 12 wherein the wall thickness of said undulated-wall honeycomb structure is about 0.2 to 1.2 mm.

15. (Withdrawn) A fine particle removing filter according to Claim 12 wherein the cell density of said undulated-wall honeycomb structure is about 50 to 600 cpsi (cells per square centimeter).

16. (Previously Presented) An undulated-wall honeycomb structure according to Claim 1, further comprising a housing containing said honeycomb structure, and a catalyst located on the surface of the cell wall face and/or in micropores within the walls of said honeycomb structure.

17. (Previously Presented) An undulated-wall honeycomb structure according to Claim 16, wherein the wall thickness is about 0.01 to 0.12 mm.

18. (Previously Presented) An undulated-wall honeycomb structure according to Claim 16, wherein the cell density is about 200 to 3000 cpsi (cells per square inch).

19. (Withdrawn) An exhaust gas purification catalytic converter, including the undulated-wall honeycomb structure according to Claim 16.

20. (Withdrawn) An exhaust gas purification catalytic converter according to Claim 19, wherein the catalyst component is selected from the group consisting of a three way catalyst, an oxide catalyst, an NO_x reducing catalyst, a sulfide catalyst, a volatile organic gas VOC (Gaseous Organic Compounds), and a dioxins decomposing-removing catalyst.

21. (Withdrawn) An exhaust gas purification catalytic converter system comprising a plurality of the exhaust gas purification catalytic converters according to Claim 19, and a plurality of catalytic converters wherein catalyst is carried on a normal flat-wall honeycomb structure, said catalytic converters being serially alternately arrayed.

22. (Withdrawn) An exhaust gas purification catalytic converter system, comprising an exhaust gas purification catalytic converter comprising an undulated-wall honeycomb structure having a gas flow direction and a plurality of cell passages which are mutually parallel in the gas flow direction, wherein:

intersection portions between walls partitioning said cell passages are located at a predetermined pitch at cross-sections perpendicular to said cell passages and are located in a pattern,

the wall face portions of said walls excluding said intersection portions have an undulated shape in both the gas flow direction and a cross-sectional direction perpendicular to said gas flow direction, and

said catalytic converter is located on the upstream side of an exhaust gas source, and the fine particle removing filter according to Claim 12 or a fine particle removing filter comprising a normal flat-wall honeycomb structure is on the downstream side of such exhaust gas source.

23. (Withdrawn) An exhaust gas purification catalytic converter system according to Claim 22, wherein each of said fine particle removing filters is a readily-exchangeable cartridge type.

24. (Withdrawn) An exhaust gas purification system comprising the undulated-wall honeycomb structure according to Claim 16, for capturing fine particle substances in an exhaust gas, said exhaust gas purification system comprising:

means for charging said undulated-wall honeycomb structure for electrically capturing fine particle substances.

25. (Withdrawn) An exhaust gas purification system comprising the undulated-wall honeycomb structure according to Claim 16, for capturing fine particle substances in an exhaust gas, said exhaust gas purification system comprising non-thermal equilibrium plasma (non-thermal plasma) or microwave discharge plasma.

26. (Withdrawn) A fuel tank evaporation system including the undulated-wall honeycomb structure according to Claim 16, for suppressing external leakage of volatile components of fuel.

27. (Withdrawn) An exhaust gas purification system according to Claim 24, wherein said undulated-wall honeycomb structure is a readily exchangeable cartridge configuration.

28. (Withdrawn) A fuel cell system component comprising the undulated-wall honeycomb structure according to Claim 16.

29. (Withdrawn) A sandwich panel comprising the undulated-wall honeycomb structure according to Claim 16.

30. (Withdrawn) A method for manufacturing an undulated-wall honeycomb structure, comprising:

providing an extrusion forming nozzle comprising a back plate having adjacent through holes defining channels having a channel direction, wherein at least one of said through holes has a first material flow resistance differing from a second material flow resistance of another of said through holes; and

forming an undulating wall honeycomb structure having a plurality of cell passages that are mutually substantially parallel in the channel direction,

wherein intersection portions between walls defining said cell passages have a predetermined pitch in cross-sections perpendicular to said cell passages and are located in a pattern and wherein wall face portions of said walls excluding said intersection portions have an undulated shape in both the cell passage direction and a cross-sectional direction perpendicular to said cell passage direction.

31. (Withdrawn) A method for manufacturing an undulated-wall honeycomb structure according to Claim 30, wherein said back plate has a thickness that varies from the outer portion of the back plate toward the center portion of the back plate.

32. (Withdrawn) A method for manufacturing an undulated-wall honeycomb structure according to Claim 31, wherein said back plate has first through holes and second through holes, wherein said first through holes have diameters differing from diameters of said second through holes.

33. (Canceled)

34. (Previously Presented) An exhaust gas purification system according to Claim 25, wherein said undulated-wall honeycomb structure is a readily exchangeable cartridge configuration.

35. (Canceled)

36. (Currently amended) An undulated-wall honeycomb structure comprising a plurality of cell passages, said cell passages being mutually parallel in a channel direction, wherein

(1) intersection portions between walls partitioning said cell passages have a predetermined pitch at cross-sections perpendicular to said cell passages and are formed in a pattern,

(2) first wall face portions of said walls excluding said intersection portions have an undulated shape in both the cell passage direction and the cross-sectional direction perpendicular to said cell passage direction, and

(3) second wall face portions having a flat shape ~~intermingle~~ alternating with said first wall face portions having an undulated shape.